STRAN-STEEL

REFERENCE MANUAL

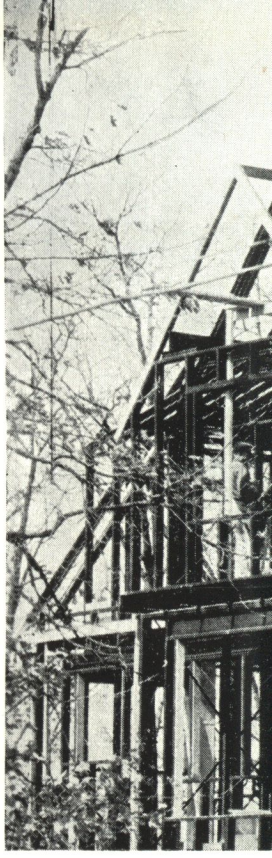
Prepared for

ARCHITECTS

ENGINEERS

and

CONTRACTORS



PROGRESS — *the* KEY *to* INDUSTRIAL SUCCESS

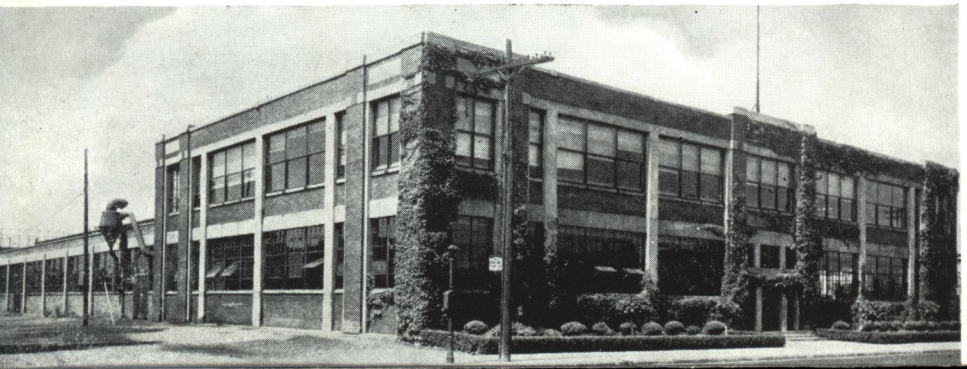
Home building, for generations, has shown wide fluctuations in volume. It has always been a business of booms and slumps, lacking those stabilizing elements of real *progress* which have been responsible for the steady growth of other major industries.

During the years 1931 to 1934 inclusive, the volume of home building all but disappeared. Changes in design, appointments and equipment failed to stimulate any appreciable recovery. Gradually, designers and builders of houses learned that the public would no longer buy, nor would sources of building money finance homes which were neither safe as abodes nor secure as investments. They realized that home values had not kept pace with the improved values offered by the more progressive industries. In short, homes could no longer compete for a major portion of the nation's savings.

The STRAN-STEEL Corporation, subsidiary of one of the oldest and largest manufacturers in the automotive industry, has applied to the home-building industry the same type of research which has for years been a major factor in lessening the severity of slumps in the automobile business. The object of this research was to improve the raw materials in order that the finished product—new homes—might keep pace with improved values in other lines of merchandise and again compete for a major portion of the public's savings. The results of this research are now well known to most people connected with the building industry.

The success of STRAN-STEEL has not depended upon "revolutionizing" home building. Its acceptance upsets no established trade nor attempts to substitute for successful practices the dreams and theories of visionaries. Its rapidly increasing use by architects and builders is the sign of *real progress.* A very old industry has found STRAN-STEEL a *key* to *new success.*

HOME OFFICE, DETROIT, MICHIGAN



STRAN-STEEL
CORPORATION

●

6100 McGRAW AVE., DETROIT

DEALERS IN MOST
PRINCIPAL CITIES

STRAN-STEEL

● Specification of STRAN-STEEL and fire-safe construction for the house shown above was made after the foundations were finished. The change did not alter a single dimension or delay completion.

WHAT IT IS—STRAN-STEEL is a light gauge, exceedingly strong steel framing material for houses, partitions and all light loadbearing structures. It is not to be confused with standard structural steel which is used in the framing of relatively large buildings. A feature of its design (see phantom illustration below) permits nailing collateral materials directly to the steel. STRAN-STEEL is supplied in the form of joists, studs, rafters and plates (see page 8) and is carried in stock in standard lengths (see table, page 12). It is shop-coated with an adhesive finish which protects it so thoroughly that no field painting is required.

HOW IT IS USED—Since STRAN-STEEL is produced to conform to the established dimensions of the materials which it replaces, its use requires no changes in architectural plans or dimensions. STRAN-STEEL permits the use of all standard exterior and interior materials and finishes. It is erected easily and rapidly by anyone skilled in carpentry. Connections are made by simple attachments (see page 9), screw driver, and metal screws. No welding is required.

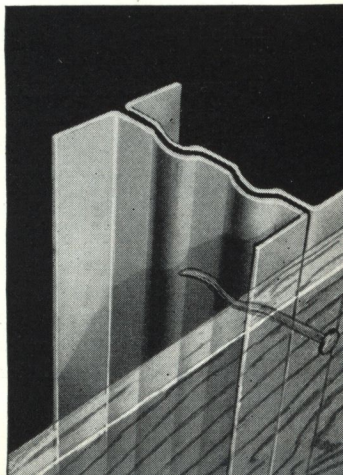
Framing a building with STRAN-STEEL follows the traditional practice closely, except that all members are ordinarily spaced on two-foot centers. This reduces the number of members used and materially simplifies certain subsequent operations such as duct work. Foundation thicknesses are unchanged. Standard STRAN-STEEL specifications are shown in condensed form on page 10. STRAN-STEEL is used in many ways other than in house construction; some interesting industrial uses are illustrated and described on page 11.

WHAT IT DOES—STRAN-STEEL framing used with concrete sub-floors (see pages 2 and 3) and fire-safe collateral materials makes a wholly fire-safe structure. The steel framework being grounded by soil pipes, water pipes, etc., the entire structure is completely lightning-proof. (Radio reception, however, is not affected.) STRAN-STEEL framing entirely eliminates joist and stud shrinkage with its attendant plaster cracks, warped floors and sticking doors and windows. A STRAN-STEEL structure remains indefinitely exactly as built—a credit to its designer and builder—a source of satisfaction and security to its owner. STRAN-STEEL, obviously, is *termite-proof*.

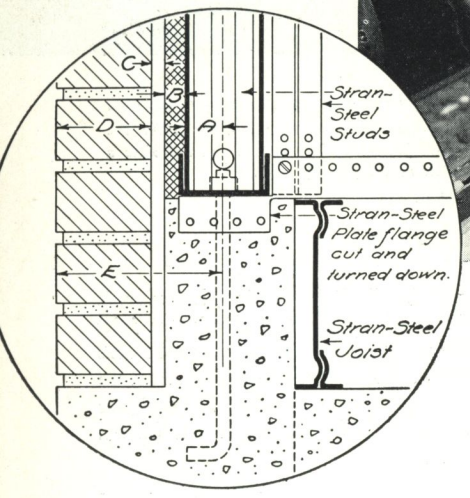
HOW IT IS SOLD—STRAN-STEEL is sold by the lineal foot. It is stocked in standard lengths (see table, page 12). The plate and half-stud (illustrated on page 8) are stocked and shipped in 20-foot lengths and cut with a hack saw. STRAN-STEEL is handled through 120 dealers in most principal cities. Plans may be submitted to these dealers or may be sent directly to the company for estimates. Delivery may usually be made either by truck or freight within a few days to nearly any part of the country.

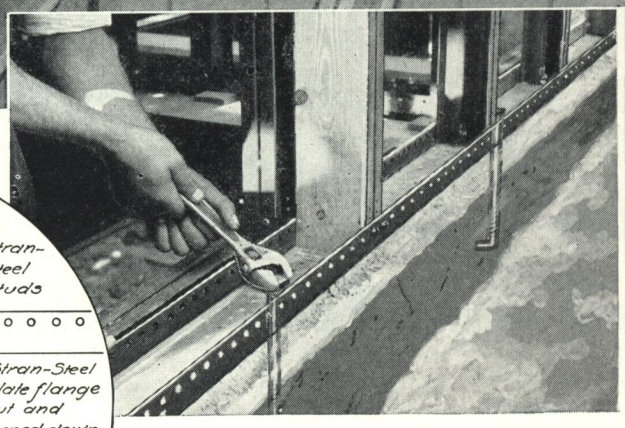
WHAT IT COSTS—STRAN-STEEL and fire-safe construction costs, in most localities, about the same as solid masonry construction, and of course permits much greater latitude in the matter of design, wall and roof construction and insulation. When the savings in maintenance, repairs and insurance are calculated over the entire financing period, STRAN-STEEL fire-safe construction presents decided economies. As additional advantages, the safety of the occupants and the security of resale value are important.

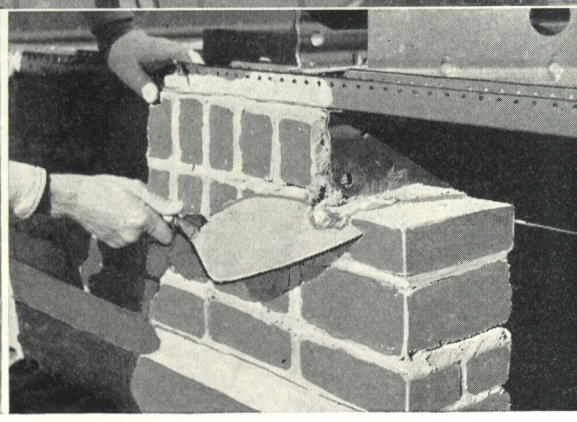
● Phantom view showing how collateral materials are nailed directly to STRAN-STEEL. (Feature patented in U. S. and foreign countries.)



FLOOR and WALL CONSTRUCTION







● *Top:* Stapling metal lath directly to STRAN-STEEL joists before pouring 2-in. concrete subfloor. *Left:* Diagram showing the four dimensions, A, B, C, and D which, added together give the distance (E) from center line of anchor bolts to exterior face of finished wall; drawing shows brick veneer construction with standard plate, dimension E equaling 7 in. *Center:* Anchor bolts set in foundation wall approximately 4 ft. on center, but not closer than 12 in. to corners. *Right:* Bricking in ends of STRAN-STEEL joists.

STRAN-STEEL-SHRINK-PROOF

STEEL FOR PERMANENCY—Floor construction is of great importance in the elimination of shrinkage damage as well as in the protection of the entire structure against basement fire hazards. STRAN-STEEL framing permanently eliminates shrinkage and warpage and also makes possible new economies in fire-safe floor construction.

FIRE-STOP FLOORS WITH STRAN-STEEL—House construction can no longer be classed as modern which does not include fire-safe floors at first and second stories. STRAN-STEEL is particularly adaptable to this type of construction. A 4-lb. ribbed or wire reinforced lath procurable in 8 ft. 2 in. lengths is stapled directly to the tops of STRAN-STEEL joists. On this is poured a 2-in. concrete slab (2000 lbs., 1-3-4 mix). Concrete subfloors correctly laid are safe, permanent and virtually sound-proof.

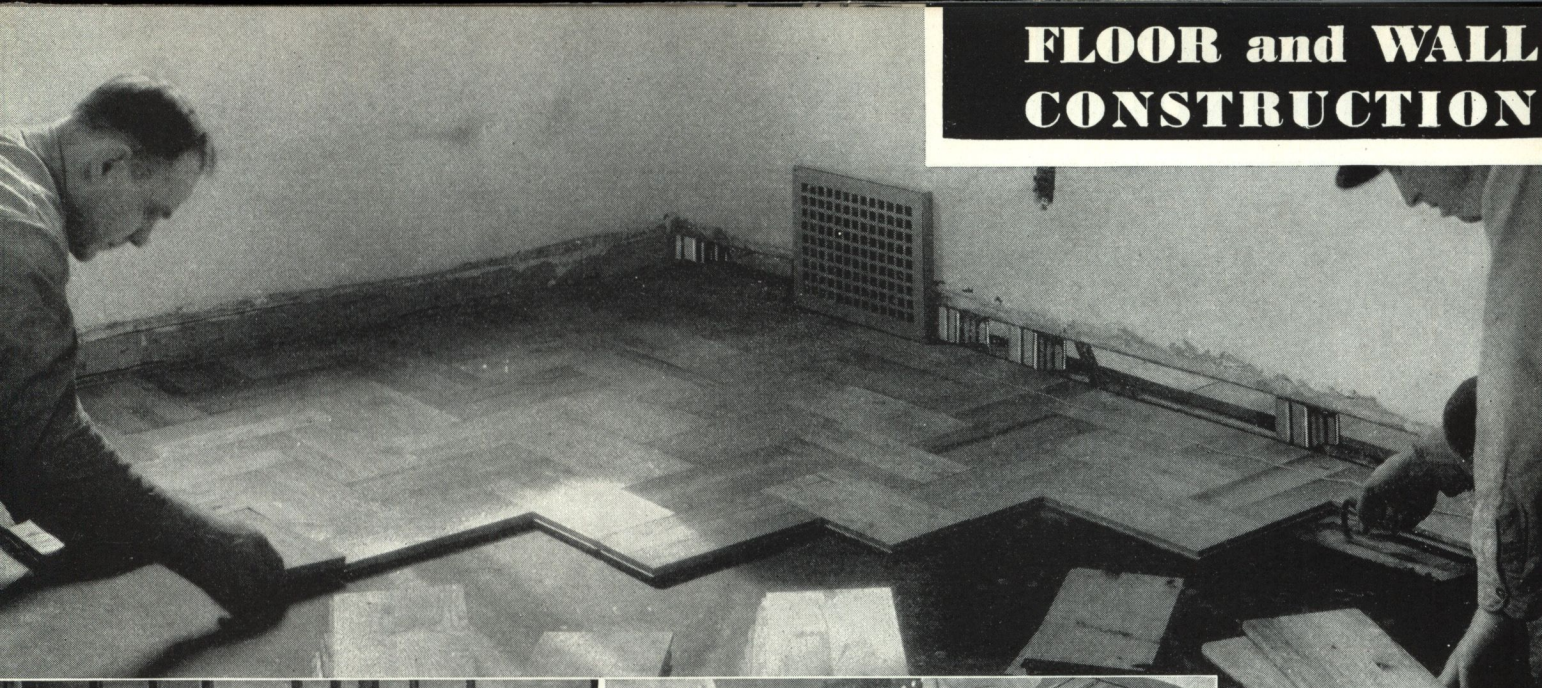
SETTING STRAN-STEEL JOISTS—STRAN-STEEL floor framing parallels conventional practice exactly. STRAN-STEEL joists are all 8 in. deep and vary only in the thickness or gauge of the steel. Longer spans and heavier loads require heavier gauge steel (see table, page 13). The 8-in. uniform depth permits lower roof lines without sacrifice of ceiling heights and saves from two to four inches of all collateral materials at each story. Outside foundation walls running parallel to joists are laid up 8 in. higher than walls on which the joists are set. Joists are ordinarily spaced 24 in. on centers and ends are bricked in or closed with concrete backup fill. Joists are easily framed into each other by means of joist hangers (shown on page 9).

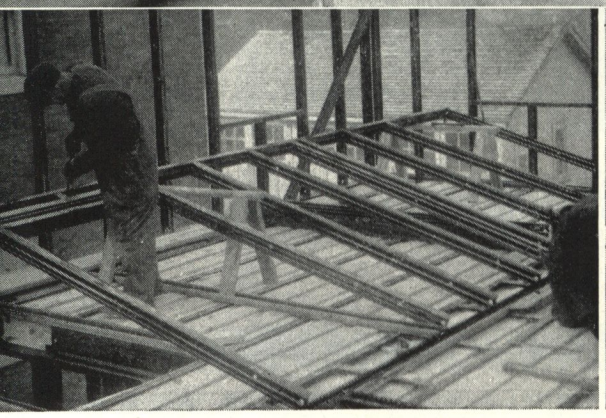
SETTING ANCHOR BOLTS—Anchor bolts should conform in diameter, length and spacing to local building codes. Usually ½-in. bolts approximately 4 ft. apart are used. Bolts 12 in. long are recommended for poured foundation walls, 16 in. where masonry units are used. Bolts should extend 1 in. above level of joist tops and not closer to corners than 12 in. In outer walls, anchor bolts should be set on either side of heater ducts and door openings. Distance from outside finish wall to center line of anchor bolts is easily calculated. (See illustration above.) Absolute accuracy in setting anchor bolts is not essential since holes in plate are punched on the job.

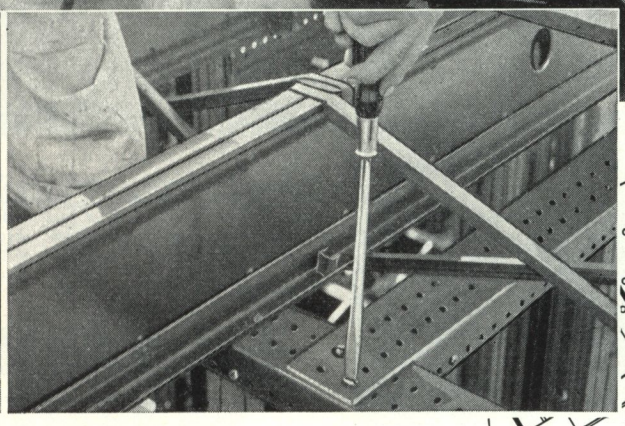
BRIDGING—STRAN-STEEL bridging (see page 9) is formed from light, rigid channel. It is notched at both ends to engage joist flanges and is easily and rapidly attached.

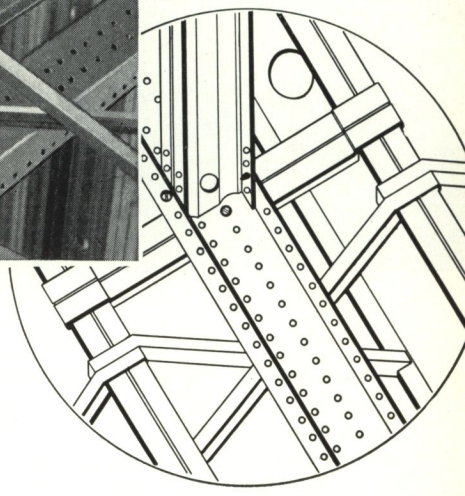
STRAN-STEEL PLATE—The plate in STRAN-STEEL framing serves the same purpose as the plate in ordinary construction. It is a 16-gauge channel to which the studs are attached. It is punched at intervals of one inch to permit the use of steel attach-

FLOOR and WALL CONSTRUCTION









● *Top:* Laying wood block finish floor in mastic on concrete sub-floor. *Left:* Wall panels are assembled in convenient sections before raising; when complete, the panel is raised and each stud fastened into bottom plate with attaching screws. *Center:* Lapping and connecting intersecting plate at upper corner. *Right:* Method of supporting a STRAN-STEEL nonbearing partition running parallel to and between floor joists; note partition support used under each stud in partition.

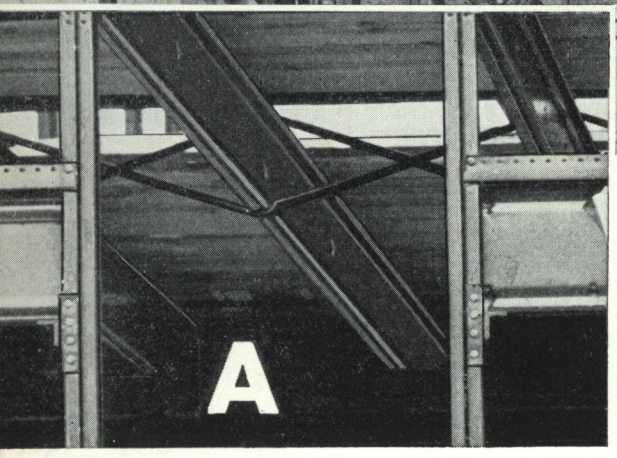
FIRE-SAFE, PERMANENT

ing screws. STRAN-STEEL plate is furnished in two widths (see page 8). The standard plate is used with STRAN-STEEL 3⅝-in. studs; the narrow plate is used with STRAN-STEEL 2$\frac{5}{16}$-in. studs. Both plates are shipped in 20-ft. lengths and are easily cut to length with a hand hacksaw at the job, thus permitting the contractor to compensate for variations in foundation dimensions or anchor bolt settings. All upper plate should be laid out exactly from the lower plate immediately beneath it. This insures vertical alignment of holes and plumb studs. (See illustration No. 4, page 5.) Parallel plates should be laid out in a similar manner to assure lateral alignment of studs in outside wall and inside partitions. Plates are lapped at corners by hacksawing through and bending out or cutting off the flanges of one. (See illustration above.)

STRAN-STEEL EXTERIOR WALLS—STRAN-STEEL with brick or stone veneer, stucco or any of the newer exterior materials, permits a type of construction which is as permanent as solid masonry, is shrink-proof, termite-proof and lightning-proof. It also permits the construction of moisture-proof walls, and the use of exterior insulating sheathing and fill insulation if desired.

FRAMING STRAN-STEEL WALLS—Framing walls with STRAN-STEEL follows conventional practice very closely. Steel attachment screws rapidly and rigidly secure the studs to the plates. Studs are spaced on 24-in. centers over joists. Two screws in diagonally opposite flanges of the stud form the connection at top and bottom. STRAN-STEEL studs are manufactured in two widths, 3⅝ and 2$\frac{5}{16}$ in. The former are designed for buildings not exceeding three stories. The latter may be used for full two-story construction. Studs are assembled to upper plates; as wall sections are raised, (see illustration above) bottoms of studs drop into bottom plates and are secured by screws. Outside walls running parallel to joists are framed 8 in. higher than walls which support joists, to level with tops of joists. Partitions which do not support joists and which run parallel to (and between) joists are supported by partition supports (see drawing above); the two joists to which partition supports are attached must be increased two gauges in thickness to carry the additional weight of the partition. Where there are no heat or plumbing stacks and the partition is directly over a joist, the lower plate is omitted, the joist is doubled, and the partition studs are attached with 2-in. sections of plate secured directly to the joists.

FRAMING WALL OPENINGS



● *Above:* First story framed with STRAN-STEEL; note 8-in. joists used as headers above openings, also plate used as sills under windows with flanges down, and above headers with flanges up to receive ends of jack studs. *Left:* Insert A, enlarged to show header brackets connecting headers to adjacent studs; note how flanges of plate are connected to stud flanges with attaching screws, after slotting web of plate at each corner.

FRAMING DOOR and SIMPLE and RAPID

FURTHER ADVANTAGES OF STRAN-STEEL—Openings are as simple to frame in STRAN-STEEL as in conventional construction with these additional advantages: (1) openings remain true and square as framed; (2) size and locations of openings may be altered to suit conditions arising on the job by merely removing and replacing a few attaching screws.

HEADER BRACKETS—Header brackets (see page 11) are located and attached to studs before studs are erected. Four holes are factory-punched in each flange of header brackets for attachment to stud and header flange. After locating position of brackets, $\frac{13}{64}$-in. holes are hand-punched in the stud flanges for securing brackets. Ends of joist header should be 1 in. and ends of header and sill plates ½ in. from center lines of supporting studs.

A minimum of three screws to each side of each header bracket is used. On headers carrying heavy loads four screws should be used on each side.

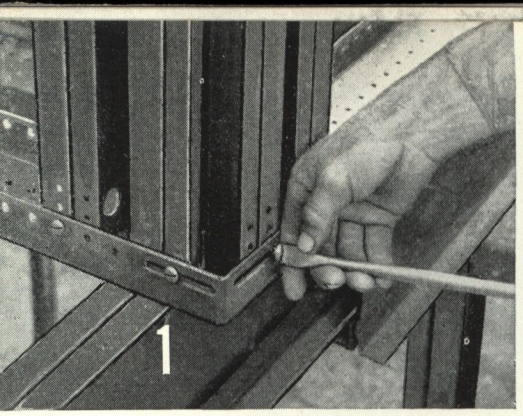
HEADER CONSTRUCTION—Headers for openings in load-bearing walls use STRAN-STEEL 8-in. joists, gauge being determined by loads. To the top of the joist header is *nailed* a section of STRAN-STEEL plate, flanges up, to receive jack studs. The web of this plate is slotted ⅞ in. with a hacksaw, close to flange at each corner. Into these slots extend the flanges of the supporting studs and are secured with attaching screws. For headers over most openings in non-bearing walls and partitions, as well as for sills under windows only the plate is used. Joist headers are cut 2 in. shorter than center-to-center dimensions of the supporting studs. Header and sill plates are cut ½ in. shorter than center-to-center dimensions of the supporting studs. Holes in sill plates and plates over headers should be aligned vertically with upper and lower plates.

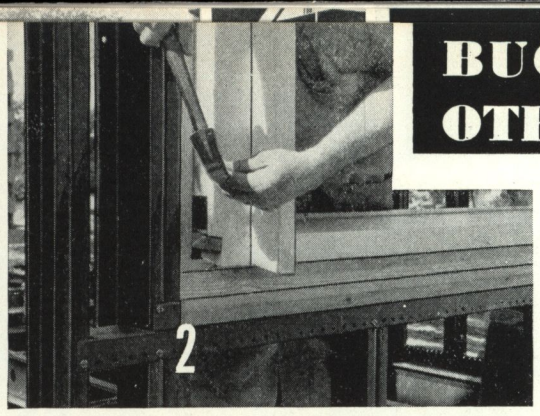
JAMB STUDS—Either of the studs supporting headers may serve as jamb studs. Generally, to correctly locate openings, additional studs are run from bottom of header to sill plates in window openings or bottom plate in door openings. These serve as jamb studs and are attached to plate headers and window sills with 2-in. sections of plate and to joist headers with rafter clips (see page 9).

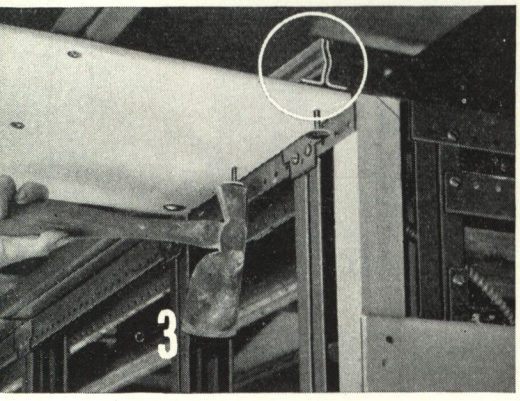
ALLOWANCE FOR DOORS AND WINDOWS—Distance from center to center to STRAN-STEEL jamb studs is 4 in. greater than the width of clear (rough) opening ordinarily allowed in wood frame construction. Bottom of STRAN-STEEL headers should be 1⅝ in. higher to allow for wood bucks, plus 2 in. higher to allow for concrete subfloor, than is ordinarily allowed in wood frame construction.

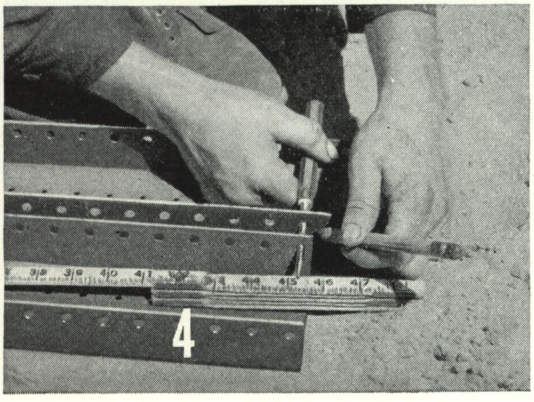
ALLOWANCE AROUND STAIR WELLS—Centers of STRAN-STEEL joists running parallel to stair stringers are set back 2 in. from face of rough opening to allow for wood bucks inserted between joist flanges. Stair trim is nailed to these bucks.

ALLOWANCE FOR PLASTER BASE—Savings in labor and material directly resulting from the shrink-proof quality of STRAN-STEEL are affected in the application of plaster base and base grounds where continuous walls are intersected by partitions. Plaster base and grounds may be run behind corner studs of intersecting partition by setting these studs back one inch from face of continuous wall. This eliminates backing and cutting of plaster base at corner.



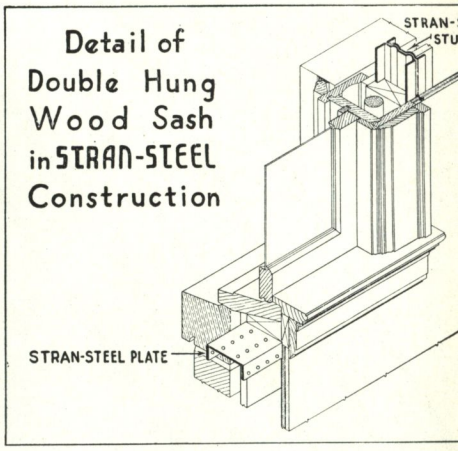


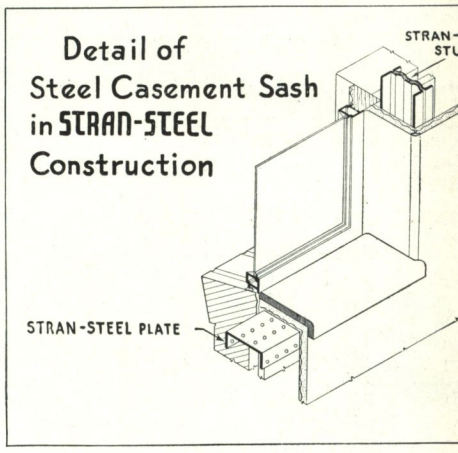




● 1—Reinforcing stud corners with corner bracket. 2—Nailing wood casing to wood bucks, the latter attached with nails through flanges of STRAN-STEEL stud and holes in sill plate. 3—STRAN-STEEL half-stud used as lath backing in ceiling corner between joists. 4—Aligning holes in upper and lower plates before cutting to length. Detail drawings show methods of framing window casings into STRAN-STEEL brick veneer construction.

BUCKS, NAILERS OTHER MATERIALS





WINDOW OPENINGS with STRAN-STEEL

FRAMING DOORS AND WINDOWS—Door and window frames are attached to STRAN-STEEL by means of rough wood bucks placed between flanges of jamb studs, under joist headers, and over window sill plates where wood stool is used.

BUCKS—These are purchased locally. They are ripped to fit between flanges of studs adjacent to openings. Where the standard studs are used the buck is ripped to $3\frac{7}{16}$ in. from a standard wood 2 x 4. Where bucks are to be used with narrow studs for greatest economy these are ripped from a standard wood 2 x 8. Holes for nailing bucks in place are hand-punched in opposite flanges of studs; space holes about four inches from each end of bucks and approximately every 12 in. between end nails. Holes for these nails are hand-punched along center line of plate, one near each end and approximately 1 in. apart between end holes.

PLASTER BASE GROUNDS—Base grounds, 1 x 4 or 1 x 6, depending upon width of baseboard, are recommended to provide adequate nailing for base.

CORNER NAILERS—Where sheathing or exterior insulating material is used, adequate nailing is provided by STRAN-STEEL half studs (see illustration No. 1, above). Corner nailing may also be provided by wood 2 x 2's at exterior corners; at interior corners they furnish a convenient base for attaching corner bead.

PLASTER BOARD AND INSULATING—All insulating sheathing and plaster board is attached rapidly and securely to STRAN-STEEL by nails which penetrate $1\frac{1}{4}$ in. or more into nailing groove. Nail heads should be sufficiently large to prevent their pulling through and also allow them to firmly hold adjacent edges of plaster or insulating board where joints occur at center of stud. A most satisfactory nail for this purpose is carried in stock. (See page 9.)

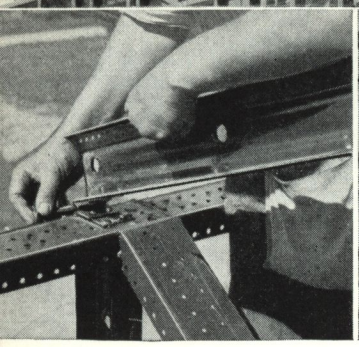
LATH BACKING AT CEILING—When lath backing is required at tops of partitions running parallel to joists, STRAN-STEEL half studs are used (see illustration No. 3 above). At the ends they are secured by attaching screws to the top plate of the bearing partitions. They are also secured at four-foot intervals with combination clips. The convex side of the half stud nailing groove should be toward the partition.

FURRING—Where partitions must enclose soil pipes or ducts, the outside dimensions of which are greater than $3\frac{5}{8}$ in., (the depth of STRAN-STEEL standard studs) a double partition is built using two rows of STRAN-STEEL narrow studs set in narrow plate at top and bottom; the distance apart of the inside faces of the double partition is determined by the overall dimensions of the stack or duct to be enclosed.

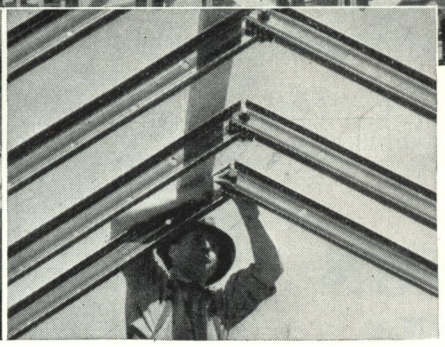
WINDOW SASH—The drawings shown above illustrate two common types of sash and one method of framing each. It is to be noted that when double hung sash are used, exterior walls should be framed with STRAN-STEEL $3\frac{5}{8}$ in. studs. STRAN-STEEL $2\frac{5}{16}$ in. studs allow adequate wall thickness for framing in casement sash, and may be used with economy for full two-story construction.

ROOF FRAMING

● STRAN-STEEL rafters, raised in pairs and temporarily braced with boards laid diagonally across upper flanges and held with nails driven directly into the nailing grooves of the rafters. Temporary bracing is removed as permanent covering is applied.



● Inserting hinge pin in rafter rings; the hinge takes care of any pitch roof and pin is located in place with cotter key.



● Tightening bolts at rafter peak after rafters have been raised and temporarily braced in position.

STRAN-STEEL FOR RIGID, PERMANENT,

ROOF A VITAL FACTOR—One of the most important factors in the permanency, rigidity and fire-safety of an entire structure is its roof. From medieval times to the present day, inflammable roof construction has been the direct cause of many of the greatest conflagrations in history; insecure roof structure accounts for most of the damage to buildings caused by high winds; rotting, warping, sagging roof framing is responsible for a large portion of the expense of maintaining and repairing a home.

Because the shortcomings of roof construction were for the most part inherent in the materials of which they were built, the deficiencies of this portion of all structures were recognized long before any way to overcome them was devised. The solution to the problem came with the perfection of methods for utilizing permanent, fire-safe building materials. Among the latest and most widely accepted of these is STRAN-STEEL.

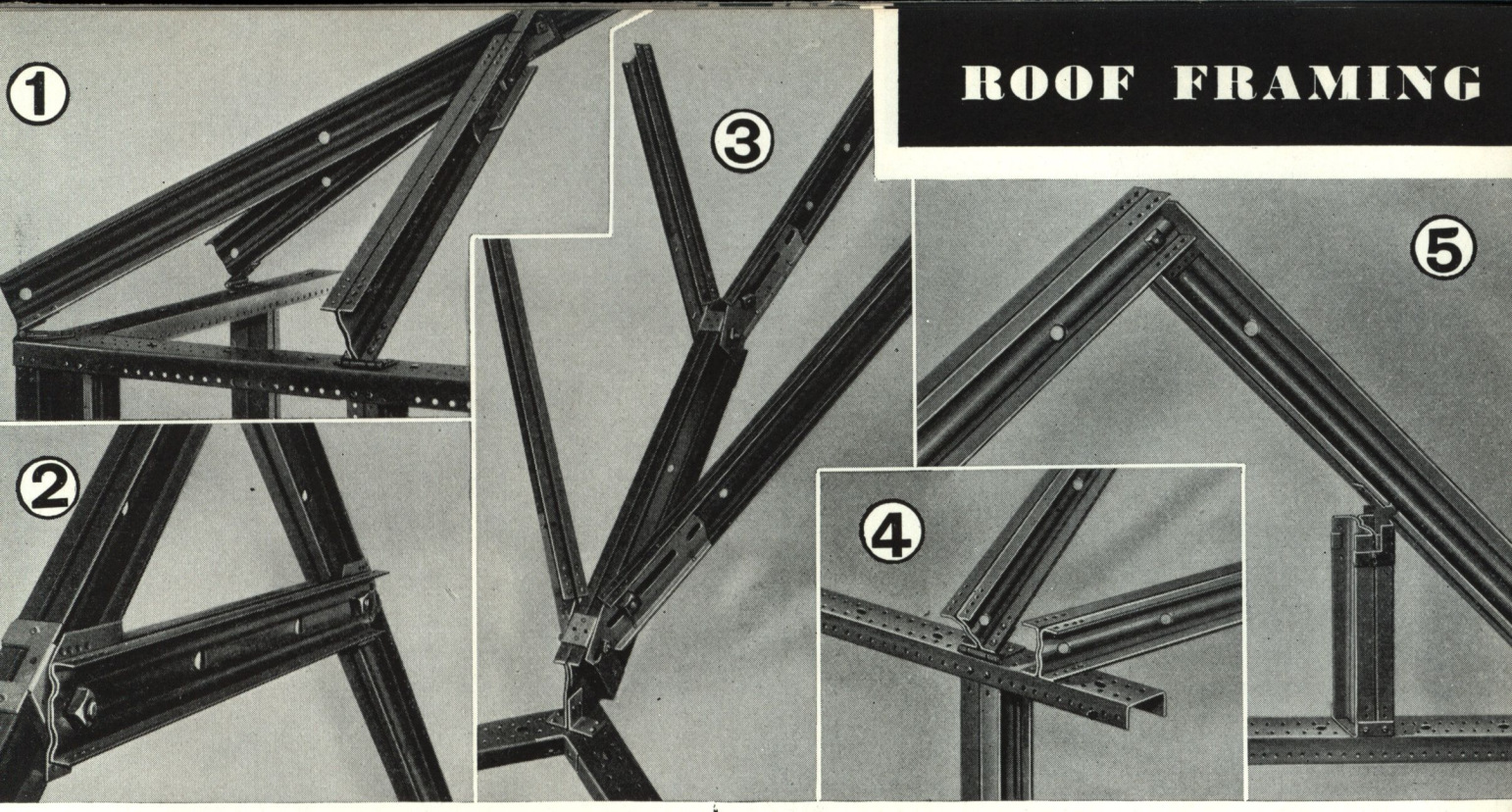
The use of STRAN-STEEL fulfills more completely *all* of the requirements and conforms more closely to traditional methods of roof construction than any other framing material.

STRAN-STEEL RAFTERS—Roof loads, pitch and span determine which STRAN-STEEL members shall be used as rafters. Their use conforms so closely to standard practice that the selection of the proper member may safely be left to anyone familiar with roof design and construction. The table of properties of STRAN-STEEL members (shown on page 12) and a table of roof bents, available on request, will be of assistance to architects and designers in selecting the proper STRAN-STEEL members best suited to unusual requirements. Under ordinary conditions STRAN-STEEL 3⅝-in. stud sections are used where 2 x4's and 2 x 6's have been used. On steep pitched roofs with long spans supports are used or STRAN-STEEL 8-in. joist sections used as rafters. STRAN-STEEL is particularly suited to flat roof construction on account of its nailing feature.

RIDGE CONNECTIONS—Rafters are connected at top by ¾ x 1½-in. bolts after adjacent flanges have been cut and bent down (see illustration No. 5, page 7). On hip roofs the hips are attached to the rafters at the top by rafter plates, cut, bent and punched to fit pitch of roof (see illustration above). Before this attachment is connected, a rafter sleeve (with two ½-in. bolts in place) for each pair of jack rafters is run on to hip to its approximate location. The same procedure is followed in attaching valleys.

RAFTER HINGE—All rafters are connected at the bottoms by special, heavy, loose-pin hinges (see illustration above) to accommodate any pitch. Each side of hinge is attached separately with four or more screws and assembled and held in position by inserting hinge pin. Hinge pin is cotter-keyed in place.

JACK STUDS—Ends of jack rafters are connected to sleeves on hip or valley rafters by rafter plates cut and bent two ways to fit angle of hips or valleys. Ends of jacks which connect to hips or valleys should be adjusted to plane of roof by means of



● All STRAN-STEEL attachments have been carefully designed for strength and simplicity; provision is made for adjustments where necessary.

1 Hip roof framed with STRAN-STEEL. Rafter hinges may be attached to rafters and plate before rafters are elevated into position.

2 Collar tie in place. This picture clearly indicates the simplicity of STRAN-STEEL roof connections as well as the rigidity of the entire roof framing.

3 Valley construction; 3⅝-in. STRAN-STEEL rafter rigidly connected to 8-in. STRAN-STEEL joist used as valley rafter. The simplicity of STRAN-STEEL attachments and the full adjustment which they permit are strikingly evident here.

4 Roof rafter and ceiling joist relationship is shown in this picture. Note alignment of center lines of stud and rafter; ceiling joist is set to one side to facilitate attachment.

5 Details of peak connection and attachment of gable stud to plate and rafter. Note how adjacent lower flanges on rafters are cut and bent at peak. Also note how rafter clip is nailed to rafter.

ROOF FRAMING—
LIGHTNING-PROOF

½-in. bolt through curved slot in rafter plate. A ¾-in. bolt with washer runs through rafter plate and hole in jack rafter. On long jack rafters, attaching screws are used to connect flanges of jack rafters to rafter plates.

DORMER JACK RAFTERS—Small dormers are set on main rafters. Dormer jack rafters are bolted together at top. Partition supports are placed across main rafters at intersection of dormer jack rafters and main roof. The jack rafters are separated by rafter plates cut and bent to correct angle to fit pitch of main roof. Main roof is sheathed first and dormer sheathing is nailed into main roof sheathing at line of intersection.

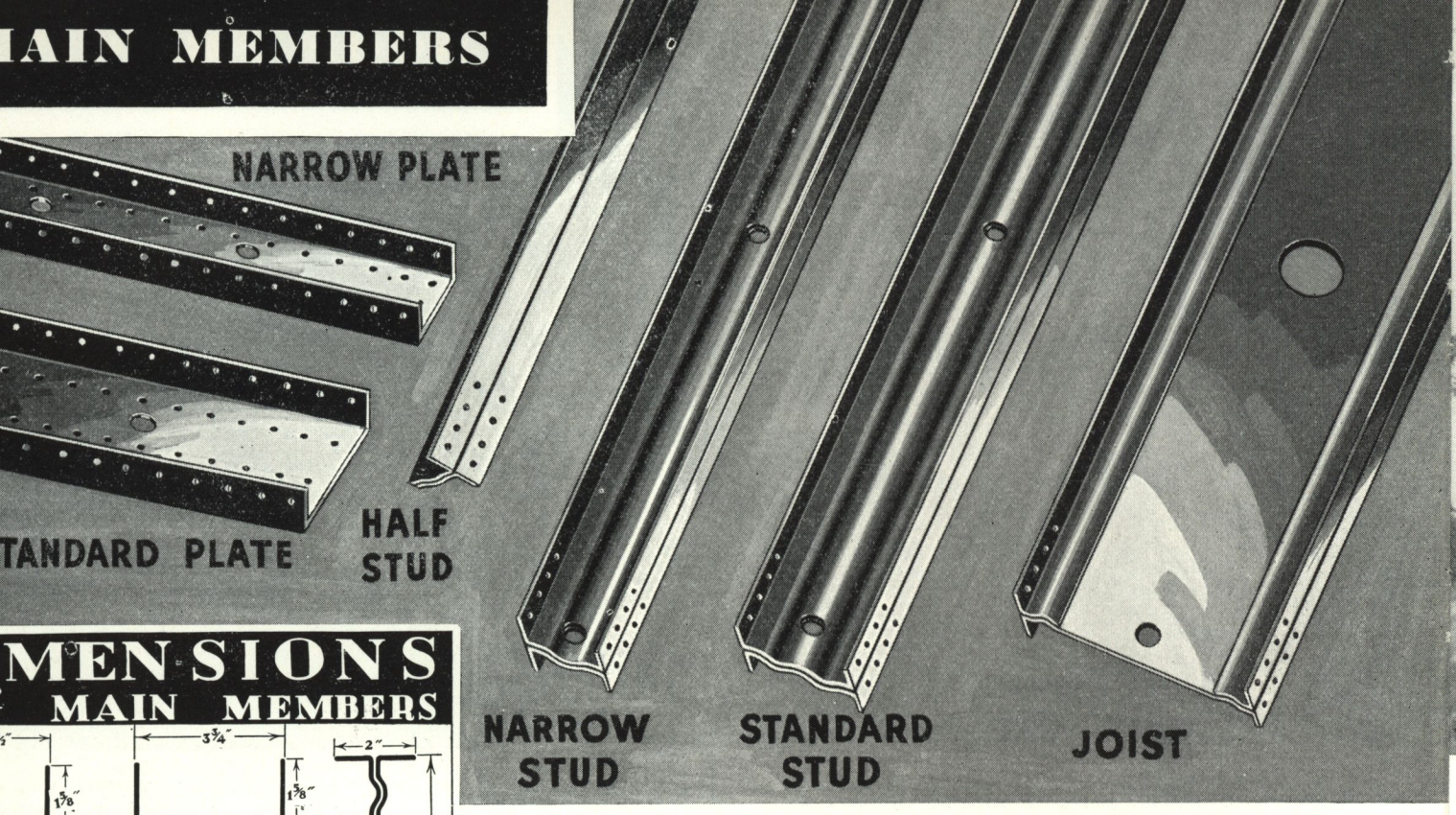
GABLE STUDS—Gable studs are attached over wall studs by 2-in. sections of plate. Connection to rafter is made by adjustable rafter clip. (See illustration No. 5, above.)

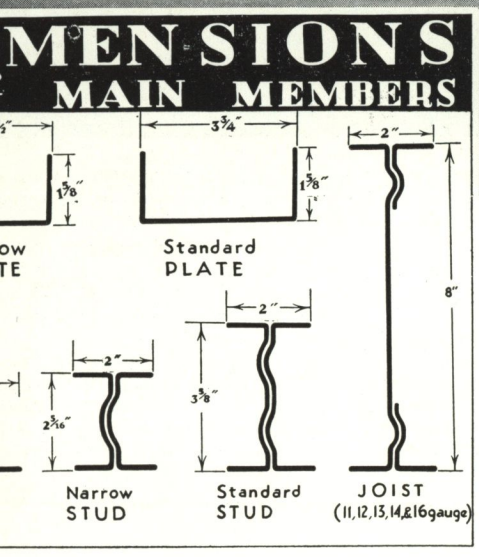
RAFTER BUCKS—The first pair of rafters at gable ends should be set with flat side of web out. They should also be punched every 16 in. along entire length of outer flanges for nailing in wood bucks. To these bucks the end of sheathing is nailed. If STRAN-STEEL 2$\frac{5}{16}$-in. studs are used as gable studs, rafter hinges attaching first pair of rafters should be set so that center line of first pair of rafters is 1⅛ in. from outside face of gable. This setting lines up outside faces of studs on gable end and allows correct attachment of rafter clip. If 3⅝-in. STRAN-STEEL studs are used as gable studs, rafter hinges should be set so that center line of first pair of rafters is 1⅞ in. from outside face of gable. Where 2$\frac{5}{16}$-in. gable studs are used, rafter bucks are 1 in. thick; where 3⅝-in. gable studs are used, rafter bucks are 1⅝ in. thick.

LOOKOUTS—Lower flanges of rafters on flat side are cut six inches from end and bent down. Horizontal wood lookouts are cut to fit cornice detail and nailed to rafter end through holes in rafter flanges.

LIGHTNING-PROOF QUALITIES—Although lightning is not ordinarily considered a major hazard, the fact remains that many fires and fatalities result each year as a result of destructive electrical storms.

A steel framed building is one of the relatively few places where one is entirely safe from lightning. The destructiveness of lightning is in almost direct ratio to the poorness of the electrical conductivity of the object which it strikes. Wood, stone, brick, concrete, all are about equally poor conductors of electricity, and all suffer accordingly when struck. In a steel frame building, however, the bolt is immediately grounded through the framework itself. Such a structure, according to the late Dr. Charles P. Steinmetz, famous electrical engineer, is the safest place to be during an electrical storm; even if struck, the steel frame grounds the destructive impact of the lightning, thus safeguarding both the structure and its occupants.





STRAN-STEEL MEMBERS

SIMPLICITY and adaptability characterize STRAN-STEEL. There are only six main members. One of these, the joist member, is supplied in five gauges to accommodate varying floor spans and loads. All joist sections are 8 in. deep. This affects material savings at each floor level and permits lower over-all dimensions without sacrificing ceiling heights. Studs and plate are furnished in two widths. Rafters are formed from either stud or joist sections.

● Width over flanges and depth of STRAN-STEEL members is shown above. All are made from 16-gauge steel (.0625 in.); joists are also furnished in four other gauges as mentioned below.

JOIST, 8 IN., FURNISHED IN FIVE GAUGES—16, 14, 13, 12, 11. This member is used chiefly in floor construction. It is designed to replace wood 2 x 8's and 2 x 10's; spaced 2 ft. on centers it supports clear spans up to 18 feet with total load of 75 lbs. per square foot (see table, page 13).

STANDARD STUD, 3⅝ In., 16 GAUGE—This member is used for framing outside walls up to three full stories as well as for inside bearing and non-bearing partitions which enclose heat ducts. Set 2 ft. on centers, the standard stud replaces 2 x 4's and 2 x 6's as ordinarily spaced.

NARROW STUD, 2 5/16 In., 16 GAUGE—This member is used for framing outside walls up to two full stories as well as for inside bearing and non-bearing partitions which enclose water, gas or steam pipes and wiring. The narrow stud is also used for short-span rafters and non-bearing ceiling joists. Set 2 ft. on centers, it replaces 2 x 4's as ordinarily spaced.

HALF STUD, 1 11/16 In., 16 GAUGE—Used as non-bearing nailing strip in partitions built out to enclose soil pipes, clothes chutes, extra deep duct work, etc. Also used as lath backing in corners between studs and at ceiling corners between joists.

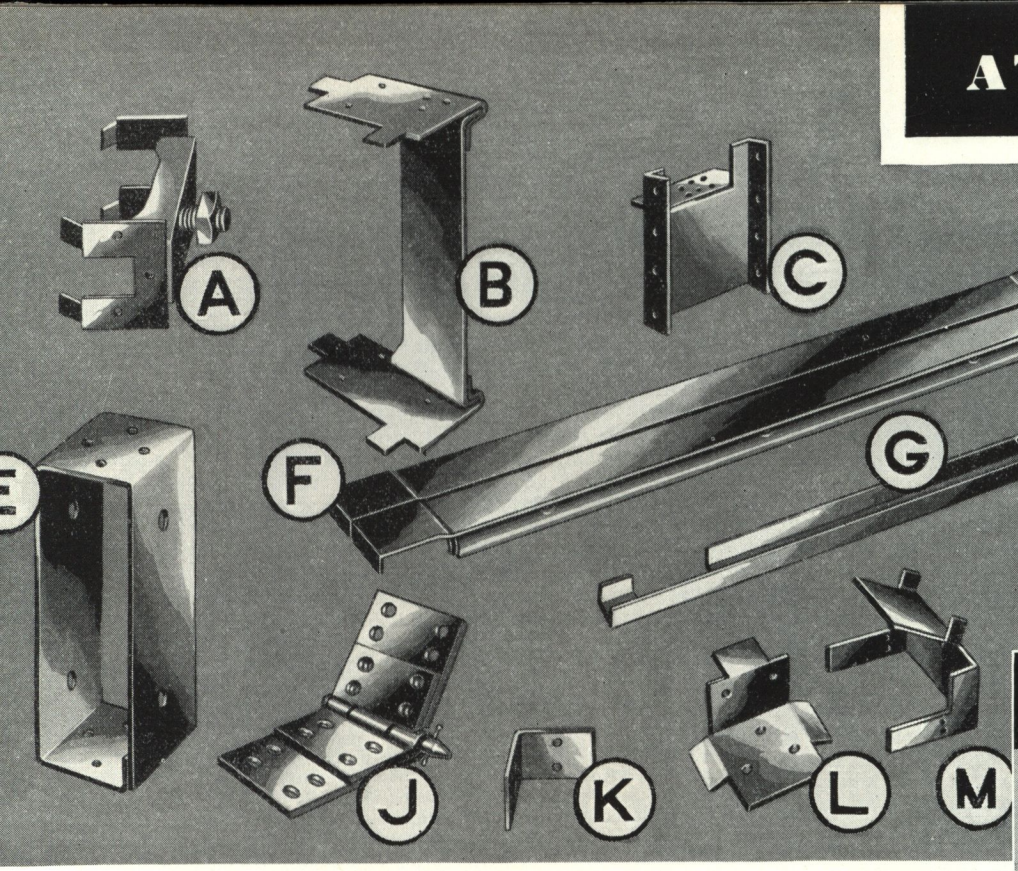
STANDARD PLATE, 3¾ In., 16 GAUGE—This member is used with 3⅝-in. stud as sill and cap plate in outside walls and partitions; also used as stringer, sill header, ribband, girt and brace. It is punched at 1-in. intervals in the flanges for aligning and attaching 3⅝-in. studs, and in the web for attaching to joist tops. In the foregoing locations it replaces 1 x 4's, 1 x 5's and 1 x 6's.

NARROW PLATE, 2½ In., 16 GAUGE—Used with 2 5/16-in. narrow stud in the same way standard plate is used with standard studs; also used with half-stud furring.

STANDARD PUNCHING—All STRAN-STEEL main members are shop punched in the flanges, and with the exception of the half-stud, in the web to permit inter-connection. 1 3/16-in. holes are also punched in the webs of the standard studs and narrow studs to permit running conduit. The web of all joists are punched at intervals with 2¼-in. holes to permit running of conduits or steam, water or gas pipes at right angles to the long axis of the joist.

FINISH—All STRAN-STEEL main members and attachments are finished with a shop coat of special, rust-resisting, red enamel. This finish is tough and very adhesive. It will not chip, and resists scratching in handling and erecting.

STANDARD LENGTHS—See table, page 12.



STRAN-STEEL ATTACHMENTS

ONE of the features which has had much to do with the rapid acceptance of STRAN-STEEL has been the simplicity of the attachments. The illustrations at the top of this page and the descriptions below show the striking degree to which all attachments have been simplified. They are designed to inter-connect all STRAN-STEEL members with metal attaching screws, or bolts; several are also punched for nailing to main members for additional security.

● Simple hand tools suffice for erecting STRAN-STEEL. Where large quantities are involved, portable power saws are frequently used.

A—COLLAR TIE BRACKET—For attaching 3⅝-in. members (used as collar ties) to rafters.

B—JOIST HANGER—For 8-in. joists, all gauges. Attaches rapidly and securely with screws and nails.

C—HEADER BRACKET, 2 SIZES—For connecting 8-in. joist headers over openings (1) to adjacent 3⅝-in. standard studs and (2) to adjacent narrow studs.

D—C-CLIP—Driven into nailing grooves of adjacent parallel members as a tie. Usually spaced 18 in. to 3 ft. apart.

E—HIP AND VALLEY COLLAR, 3 SIZES—For connecting 8, 3⅝ and 2 5/16-in. members where used as hips, valleys, and rafters.

F—PARTITION SUPPORT—Used under each stud of non-bearing partitions which run parallel to and between joists.

G—BRIDGING—Used in pairs between joists. Ends are coped out to engage joist flanges.

H—RAFTER PLATE, 2 SIZES—For top connection of hip rafters and bottom connection of valley rafters.

I—CORNER BRACKET—Used at top and bottom of stud and plate corner; also bent to reinforce all corners other than 90° such as bays, etc.

J—RAFTER HINGE—Loose butt hinge with cotter key through hinge pin; connects lower ends of rafters to plate.

K—ANGLE BRACKET—Connects rafter support from ceiling joist to underside of rafter; bent to fit pitch of rafter.

L—COMBINATION CLIP—Connects stair carriage to adjacent studs; also used for tying half-stud lath backing to adjacent studs.

M—RAFTER CLIP—Connects gable studs to rafters and jamb studs to headers.

MUSHROOM-HEAD NAILS—2½-in. coated nails with 1-in. inverted cup heads, used for attaching gypsum board plaster base, insulating sheathing, etc.; large head secures adjacent edges of board joints. Supplied in 10-lb. cartons as an extra item, if specified; 10 lbs. required for 1000 sq. ft. of side wall; 15 lbs. required for 1000 sq. ft. of ceiling.

STRAN-STEEL SPECIFICATIONS AND RECOMMENDATIONS SUGGESTED AS A GUIDE TO SPECIFICATION WRITERS

WORK INCLUDED—Shall be the furnishing and erection of the entire building frame composed of steel members manufactured by the STRAN-STEEL CORPORATION, 6100 McGraw Ave., Detroit, Michigan, *as described in their manual.*

STRUCTURAL STEEL—Where required shall be supplied, fully fabricated by general contractor as a separate item, not included in the STRAN-STEEL bill of material.

ERECTION OF FRAME—Shall be done by skilled mechanics in a substantial, workmanlike manner, true to line, level and plumb, in accordance with the manufacturer's specifications and recommendations.

SHOP PUNCHING—All framing members shall be delivered punched in accordance with the manufacturer's standard practice.

FIELD PUNCHING—All holes in addition to the standard shop punching necessary for the proper erection of the framing shall be hand-punched or drilled in the field by the erection contractor.

SHOP PAINTING—All framing members shall be given a coat of special rust-resisting paint at the shop.

FIELD PAINTING—The erection contractor shall touch up in one-coat work all spots where shop coat has been damaged.

TEMPORARY BRACING, FLOORING, ETC. — The erection contractor shall furnish and erect all necessary temporary bracing to brace and hold the framing true to line, level and plumb until the permanent bracing and complete fabrication is completed. He also shall furnish all necessary temporary floor or walkway planking required for the convenience and protection of all workmen.

JOISTS—Joists throughout shall be of sizes and spacing specified by the manufacturer. Spacing in general shall be 24 in. on centers. Joists shall have a wall bearing of not less than 4 in.

TRIMMERS AND HEADERS—Double all joists or provide heavier gauge single joists of proper carrying capacity under partitions and around all floor openings for stairs, chimneys, etc. Double joists shall be fastened together with "C" clips.

JOIST HANGERS—Provide joist hangers for the support of headers at trimmers and for the support of all tail joists at headers and similar positions unless these members are coped between the flanges of the supporting beams.

CROSS BRIDGING—Provide special channel type bridging spaced 6 ft. apart on centers for all joist spans exceeding 8 ft. Bridging shall be secured by bending ends over joist flanges.

PARTITION SUPPORTS—Where partitions running parallel to the joists are not directly supported by a joist, provide half stud partition supports with coped and crimped ends spanning between two joists centered under and supporting each stud of the partition (24 in. apart on centers). Bend ends of partition supports over and nail to the top flange of the joist.

CHANNEL PLATES—Channel plates to fit studs shall be provided as sills and plates for all exterior wall studding, all interior partitions, and elsewhere where required. Channels shall be lapped and fastened with two (2) screws at all corners.

ANCHOR BOLTS—Sills for exterior wall studding on masonry walls shall be secured to masonry with ½-in. diameter hook bolts spaced 4 ft. apart on centers; anchor bolts to be furnished and built in by the masonry contractor.

STUDDING—Studs spaced, generally, 24 in. apart on centers shall be provided for all exterior walls and interior partitions secured to sills and plates with four (4) screws each, two at top and two at bottom through diagonally opposite stud flanges. Provide jack studs between main wall sills and plates and window sills; between window and door lintels or headers and main wall plates above; for all gable walls; and wherever else required to provide nailing for enclosing exterior and interior wall material or finish. Where sills and plates with flanges are not provided to which to secure jack studs, provide stud clips. At gable end rafters provide rafter clips—nail clips to both studs and rafters and bend wings around stud flanges. Double studs at the jambs of all openings where the loads cannot be safely carried by a single stud. Secure double studs together with "C" Clips spaced approximately 3 ft. apart on centers.

JAMB STUDS—Provide studs to serve as jamb studs at all openings where main wall or partition stud spacing does not fulfill requirements.

OPENING SILLS AND HEADERS—Sills and headers shall be provided as required for all exterior and interior wall and partition openings, and headers shall be secured by header brackets.

PARTITION FURRING—To increase the thickness of partitions to accommodate pipes, ducts, etc., furr the main partition with half studs secured to narrow plates. Brace furring to main studding at center.

STAIR CARRIAGES—When specified, provide stair carriages for all stairs in pairs or threes as the width and character of the stair runs require. Frame also for all stair landings or platforms. Carriages shall be formed of stud or joist members substantially framed and secured to stairwell headers with rafter sleeves bolted to both carriages and headers and secured to studs with combination clips.

RAFTERS—Rafters shall be spaced 24 in. apart on centers. For pitched roofs, rafters shall consist of stud or joist members depending on the span and loads supported. For flat roofs, rafters shall consist of joist members. The heel of each rafter shall be secured at the wall to the well plate with an adjustable rafter hinge screwed to both rafter and plate. Rafters shall be secured to the ridge by cutting away adjacent lower flanges and bolting together through webs of rafters. Jack rafters shall be secured at heels as specified for main rafters and at hip and valley rafters with rafter sleeve and rafter plates. Rafters meeting at ridge line shall lap each other and be bolted together through the webs.

HIP AND VALLEY RAFTERS—Shall consist of stud or joist members as best adapted to spans and loads supported.

COLLAR TIES—Shall be provided to brace and tie rafters together where required. They shall consist of stud members having the flanges abutting rafters cut and bent to the plane of the webs. Secure collar ties to rafters with collar tie brackets —bend wings of brackets around rafter flanges and bolt ties to brackets.

DORMERS—Where and if specified, dormers shall be constructed of STRAN-STEEL framing. Frame in the same manner as specified for similar parts of the main structure.

RECOMMENDATIONS

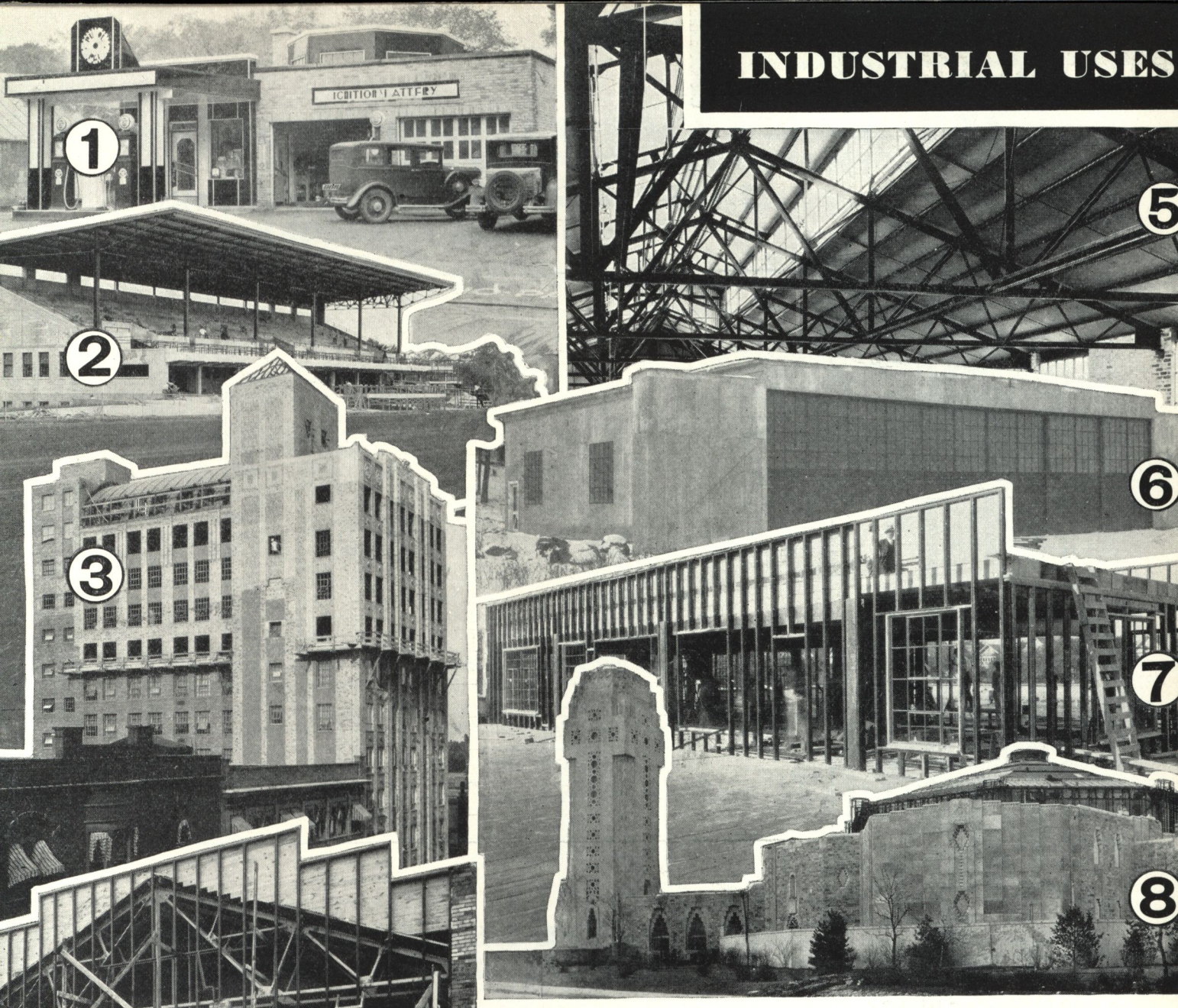
FLOORS (Concrete)—All subfloors shall be of 2 in. thick 2000 lb. 1-3-4 mix concrete, reinforced. Reinforcement shall be ¼ in. diameter plain rods placed not more than 6 in. on centers, or ⅜-in., 4-lb. rib lath, or wire mesh. Reinforcement, lath, or mesh should be stapled directly to tops of STRAN-STEEL joists. Top surface of concrete slab shall be prepared to receive finish flooring.

(Wood)—In some instances, it is possible, under existing Building Codes, to use a wood floor, and same may be applied as follows: Lay 2 x 4-in. sleepers 16 in. on center, flat, at right angles to run of joists; nail sleepers to joists and nail wood subfloor to sleepers in ordinary manner.

WALLS—As a plaster base secure to each stud ⅜ in. thick approved gypsum board or a 2.5 lb. diamond mesh sheet lath. Gypsum board shall be secured with No. 12 wire 2½ in. long, 1-in. diameter disc headed, coated nails spaced not over 6 in. on centers. If board be 16 in. wide use four nails at each stud bearing.

CEILINGS—As a plaster base secure to each joist ½ in. thick approved gypsum board or a ⅜-in. 3.4-lb. rib lath. Gypsum board shall be secured in manner and with same nails as specified under "Walls."

EXTERIOR WALL INSULATING SHEATHING — Not less than ½ in. thick approved insulating board shall be nailed to each stud on exterior face of exterior wall with same nails as specified under "Walls." A superior job will be obtained if such insulating board is covered on exterior surface with an approved damp-resisting sheathing paper, well lapped and nailed.



● 1—Automobile service stations economically framed with STRAN-STEEL. 2—STRAN-STEEL in combination with standard structural steel members. 3—Light, fire-safe STRAN-STEEL made possible a complete thirteenth floor on this twelve-story building. 4—STRAN-STEEL is used for supporting new fronts on old buildings. 5—STRAN-STEEL used as purlins with structural steel roof trusses. 6—A fire-safe, inexpensive airplane hangar framed with STRAN-STEEL. 7—Penthouse construction and additions to existing buildings use STRAN-STEEL to great advantage. 8—STRAN-STEEL used to attach exterior covering to structural steel frame.

STRAN-STEEL HAS MANY INDUSTRIAL USES

ADDITIONS, PENTHOUSE CONSTRUCTION—Building code restrictions and inability to add the necessary structural support for heavy materials frequently make STRAN-STEEL the *only material with which certain types of additions to existing buildings may be made.*

FIRE-SAFE SEMI-PERMANENT CONSTRUCTION—Fire hazards definitely eliminate inflammable framing materials from a large number of semi-permanent structures. STRAN-STEEL is ideally suited to these. It is less costly than fireproof, permanent construction; it allows any kind of interior or exterior treatment, *it is 100% salvable if the structure is ever dismantled or moved.*

USES WITH STRUCTURAL STEEL—In conjunction with standard structural steel STRAN-STEEL is frequently used as girts and purlins. Its nailing feature is responsible for its increasing use as furring or backing for interior or exterior covering materials over structural steel framework.

PARTITIONS: SUSPENDED CEILINGS—The use of STRAN-STEEL for partitions is steadily increasing. It retains its alignment and requires no bracing during construction. It is sufficiently rigid to permit simultaneous plastering of both sides and obviates plaster damage around heavy doors after completion. STRAN-STEEL is also an ideal making material for suspended ceilings.

STRAN-STEEL

FIRE-SAFE FRAMING

STRAN-STEEL

FIRE-SAFE FRAMING

LIGHT GAUGE, NAILABLE STEEL JOISTS, STUDS AND RAFTERS FOR LIGHT LOAD BEARING STRUCTURES

YOU NAIL TO STRAN-STEEL

Manufactured by

STRAN-STEEL CORPORATION

DETROIT MICHIGAN